

ENTIN, G.M.

Characteristics of the mental disorders in cerebral atherosclerosis in combination with alcoholism. Trudy Gos.nauch-issl.inst.psikh. 25:47-74 '61. (MIRA 15:12)

1. Klinika sosudistykhn psikhov (zav. - prof. V.M.Banshchikov)
Gosudarstvennogo nauchno-issledovatel'skogo instituta
psikhiatrii Ministerstva zdravookhraneniya RSFSR.
(ALCOHOLISM) (CEREERAL ARTERIOSCLEROSIS) (MENTAL ILLNESS)

SAVCHUK, V.I., kand.med.nauk; GROMOVA, V.V., mladshiy nauchnyy sotrudnik;
ENTIN, G.M., mladshiy nauchnyy sotrudnik

Data from a clinical and pathophysiological study of the
therapeutic action of dicoline in the treatment of vascular
diseases of the brain with mental disorders; report No. 2.
Trudy Gos.nauch-issl.inst.psikh. 25:352-367 '61. (MIRA 15:12)

1. Klinika sosudistyykh psikhozov (zav. - prof. V.M.Banshchikov)
i otdel patofiziologii vysshey nervnoy deyatel'nosti (zav. -
prof Yu.N.Uspenskiy) Gosudarstvennogo nauchno-issledovatel'skogo
instituta psikiatrii Ministerstva zdavookhraneniya RSFSR.
(DICOLINE) (MENTAL ILLNESS) (CEREBROVASCULAR DISEASE)

ENTIN, G.M. (Moskva)

Effect of relapses in alcoholism on the vascular system following antabuse therapy. Trudy Gos. nauch.-issl. inst. psikh.
38:122-129 '63 (MIRA 16:11)

*

ENTIN, G.M., kand. med. nauk; FEDOTOV, D.D., prof., otv. red.;
LUKOMSKIY, I.I., prof., red.

[Organizational problems in the control of alcoholism;
methodological materials] Organizatsionnye voprosy
bor'by s alkogolizmom; metodicheskie materialy. Mo-
skva, 1965. 38 p. (MIRA 18:8)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut
psikhiatrii. 2. Direktor Gosudarstvennogo nauchno-
issledovatel'skogo instituta psikhiatrii Ministerstva
zdravookhraneniya RSFSR (for Fedotov).

ENTIN, G. Ya.

ENTIN, G. Ya.

New high-temperature lubricant. Proisv. smas. mat. no. 3:24-25 '57.
(MIRA 10:12)

1. Leningradskiy neftemaslozavod im. Shaumyana.
(Lubrication and lubricants)

S/081/62/000/011/041/057
E202/E192

AUTHOR: Entin, G.Ya.

TITLE: Lubricant for rolling mill equipment

PERIODICAL: Referativnyy zhurnal, Khimiya, no.11, 1962, 520,
abstract 11 M 217. (Novosti neft. i gaz. tekhn.
Neftepererabotka i neftekhimiya, no.3; 1961, 27-32).

TEXT: A new lubricant, no.78, was developed and designated
for the friction points of rolling mills. It was prepared by
thickening the distillate oil "Industrial 50" (machine type CY
(SU)) based on Na soaps of the synthetic fatty acids (6.4%)
C₁₇—C₂₀ of the Shebakinskiy kombinat (Shebakino Combine),
containing castor oil (1.6%) and colophony (0.7%). The lubricant
has a smooth structure, is stable, has good anti-seizure
properties, and distributes itself easily in the lubrication
ducts. It secures reliable lubrication of the points of friction
in rolling mill equipment and other heavily loaded aggregates.
The lubricant is capable of working in the range -20 to +120 °C;

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Lubricant for rolling mill equipment S/081/62/000/011/041/057
E202/E192

from -20 to 100-110 °C the lubricant works as a grease. With the increase of temperature it melts without demulsification and retains its lubricating properties in its liquid state. Lubricant no.78 is recommended in place of lubricant ВП -1 (IP-1) which does not form the necessary lubricating film during its use.

[Abstractor's note: Complete translation.]

Card 2/2

L 45676-66 EWT(m)/T DJ

ACC NR: AP6023625

SOURCE CODE: UR/0318/66/000/004/0027/0030

AUTHOR: Entin, G. Ya.

ORG: Leningrad Petroleum Oil Plant im. Shaumyan (Leningradskiy neftemaslozavod) 25
B

TITLE: Synthetic lubricant for electric machines

SOURCE: Neftepererabotka i neftekhimiya, no. 4, 1966, 27-30

TOPIC TAGS: grease, soap / LZ-117 grease

ABSTRACT: LZ-117, a synthetic sodium-potassium-zinc grease, has been developed at the Leningrad Plant im. Shaumyan (Leningradskiy zavod). Its fat base consists of 12% acid of the fraction C₂₀ and above and 14% of an oxidized fraction of diesel fuel. Sodium soaps are the main thickening agents, with potassium and zinc soaps present as admixtures. The mineral base is a mixture of AV spindle oil and 50 industrial oil in the proportion of 3:1. The mechanical stability of LZ-117 was determined at 50°. Changes in this and other properties during storage were studied over a period of 16 months. Although the changes were appreciable, they remained within the allowed limits. Performance tests of LZ-117 showed that after its service the lubricant was still usable. The microstructure of LZ-117 was analyzed by x-ray and electron diffraction techniques. The results of laboratory and performance tests indicate that the use of mixed soaps as the thickening agent for mineral oils has permitted the development of

Card 1/2

UDC: .665.637.6:621.892.28]:621.313

L 45676-66

ACC NR: AP6023625

0

a grease needed by the electric industry. Orig. art. has: 1 figure and 2 tables.

SUB CODE: 11/ SUBM DATE: none

Card 2/2 fv

ENTIN, I. A.

ENTIN, I. A. -- "Using Waste Heat from Rural Electric Power Stations for the Heat Supply to Agricultural Industry." Joint Academic Council, All-Union Sci Res Inst of Mechanization of Agriculture (VIM) and All-Union Sci Res Inst of Electrification of Agriculture (VIESKh). Moscow, 1955. (Dissertation for the Degree of Candidate in Technical Sciences).

So.: Knizhnaya Letopis', No. 2, 1956.

EBIN, L.Ye.; GANELIN, A.M.; GILINSKIY, A.M.; GORNOVESOV, G.V.; ZLATKOVSKIY, A.P.; KAUFMAN, B.M.; KISELEV, N.A.; KULIKOV, P.Ye.; LEVIN, M.S.; SLAVIN, M.P.; SMIRNOV, B.V.; SMIRNOV, V.I.; SMIRNOVA, I.S.; TARASOVA, V.Ye.; CHEBOTAREV, V.I.; SHATS, Ye.L.; ENTIN, I.A.; IOSIPYAN, S.G.; redaktor; SARKISYAN, A.M., redaktor; SMIRENSKIY, M.D., redaktor; TEPLITSKIY, Ya.S. redaktor; KOMAROVA, V.M., redaktor; GURNVICH, M.M., tekhnicheskiy redaktor.

[Rules for the operation of electric installations in rural areas]
Pravila tekhnicheskoi ekspluatatsii sel'skikh elektroustanovok.
Moskva, Gos. izd-vo sel'khoz. lit-ry, 1957. 183 p. (MIRA 10:4)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye sel'skikh elektrostantsii.
(Electric power plants) (Electricity in agriculture)

ENTIN, ISAAK ARKAD'YEVICH

LOBANOV, Vasily Nikiforovich; SAZONOV, Nikolay Alekseyevich; VOROB'YEV,
Vasily Fedorovich; BYULIS, Mikhail Yefimovich; GILINSKIY, Iosif
Abramovich, ~~ENTIN, Isak Arkad'yevich~~; KOPTEVSKIY, D.Ya., redaktor;
RAKOV, S.I., tekhnicheskiy redaktor

[Rural electrician] Elektromekhanik sel'skikh elektroustanovok.
Moskva, Vses.uchebno-pedagog.izd-vo Trudreservisdat, 1957. 454 p.
(Electric engineering) (MIRA 10:9)

ENTIN, I.A. kand.tekhn.nauk

Power and heat production at rural steam power plants. Mekh.
i elek.sots.sel'khoz. no.4:31-36 '57. (MIRA 12:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektrifikatsii
sel'skogo khozyaystva.

(Electric power plants)

ENTIN, I.A., kand.tekhn.nauk

Analytical method of determining characteristics of steam
engines. [Nauch.trudy] VIESKH 3:397-426 '58.
(MIRA 13:4)

(Steam engines)

SHATS, Yefim L'vovich; ENTIN, Isaak Arkad'yevich; SHKOL'NIKOV, A.B.,
red.; PNVZNER, V.I., tekhn.red.

[Power equipment of repair and supply stations and state
farms; arrangement, operation, and repair] Energosilovoe oboru-
dovanie ETS i sovkhov; ustroistvo, ekspluatatsiya i remont.
Moskva, Gosizd-vo sel'khoz.lit-ry, 1959. 351 p. (MIRA 12:8)
(Electric power plants--Equipment and supplies)
(Repair and supply stations) (State farms)

SERGOVANTSEV, V.T., kand.tekhn.nauk; YURASOV, V.V., kand.tekhn.nauk;
 ALUKER, Sh.M., kand.tekhn.nauk; ANDRIANOV, V.N., doktor tekhn.
 nauk; ASTAF'YEV, N.N., kand.tekhn.nauk; BUDZKO, I.A., akademik;
 BYSTRITSKIY, D.N., kand.tekhn.nauk; VEYALIS, B.S., kand.tekhn.
 nauk; GIRSHBERG, V.V., inzh.; GORSHKOV, Ye.M., inzh.; GRI-
 CHEVSKIY, N.Ya., inzh.; ZAKHARIN, A.G., doktor tekhn.nauk;
 ZLATKOVSKIY, A.P., kand.tekhn.nauk; IOSIPYAN, S.G., inzh.;
 ITSKOVICH, A.M., dotsent; KAUFMAN, B.M., inzh.; KVITKO, M.N.,
 inzh.; KORSHUNOV, A.P., inzh.; LEVIN, M.S., kand.tekhn.nauk;
 LOBANOV, V.N., dotsent; LITVINENKO, A.F., inzh.; MERKELOV,
 G.F., inzh.; PIRKHAVKA, P.Ya., kand.tekhn.nauk; PRONNIKOVA,
 M.I., kand.tekhn.nauk; SMIRNOV, B.V., kand.tekhn.nauk; FAYU-
 SHENKO, S.G., inzh.; KHODNEV, V.V., inzh.; SHCHATS, Ye.L.,
 kand.tekhn.nauk; EBIN, L.Ye., doktor tekhn.nauk; ENTIN, I.A.,
 kand.tekhn.nauk; SILIN, V.S., red.; SMELYANSKIY, V.A., red.;
 BALLOD, A.I., tekhn.red.; SMIRNOVA, Ye.A., tekhn.red.

[Handbook pertaining to the production and distribution of
 electricity in agriculture] Spravochnik po proizvodstvu i
 raspredeleniu elektricheskoi energii v sel'skom khoziasistve.
 Moskva, Gos.isd-vo sel'khoz.lit-ry, 1959. 900 p. (MIRA 13:2)

1.Vsesoyuznaya akademiya sel'skokhozyaystvennykh nauk imeni
 V.I.Lenina (for Budsko).
 (Rural electrification)

LOBANOV, Vasilii Nikiforovich; SAZONOV, Nikolay Alekseyevich; BEYLIS, Mikhail Yefimovich; GILINSKIY, Iosif Abramovich; ENTIN, Isak Arkad'yevich; VOROB'YEV, V.F., nauchnyy red.; SERBERINNIKOVA, L.A., red.; DEMINA, G.A., red.; ISHKHANOV, V.S., red.; TOKER, A.M., tekhn.red.

[Electrician of rural electrical systems] Elektromekhanik sel'skikh elektroustanovok. Moskva, Vses.uchebno-pedagog.izd-vo Proftekhizdat, 1960. 548 p. (MIRA 14:1)
(Electricians--Handbooks, manuals, etc.)
(Electric power distribution)

ENTIN, I.A. Prinimal uchastiye BOBCHENKO, L.I., kand. tekhn. nauk

[Means for the temporary heating and drying of buildings
under construction] Sredstva vremennogo obogreva i sushki
stroishchikhsia zdani. Moskva, Stroiizdat, 1964. 102 p.
(MIRA 17:9)

ENTIN, I.A.

Supplying gas to agricultural areas. Gaz. prom. 10 no.8:20-22 '65.
(MIRA 18:9)

SOV/81-59-9-32804

Translation from: Referativnyy zhurnal, Khimiya, 1959, Nr 9, pp 478 - 479 (USSR)

AUTHORS: Entin, I.G., Silant'yeva, A.G., Gostunskaya, I.V., Khronov, S.I.

TITLE: An Investigation of the Group Chemical Composition of Light Oil of Kerosene Pyrolysis //

PERIODICAL: V sb.: Sostav i svoystva neftey i benzino-kerosinovykh fraktsiy. Moscow, AS USSR, 1957, pp 417 - 427

ABSTRACT: The group composition of 2 light oils of kerosene pyrolysis (I and II) has been studied. Diolefines (with conjugated double bonds) were separated by heating with maleic anhydride (4 hours, boiling in ampoules). For the determination of aromatic hydrocarbons (H) with unsaturated side chains and of the nature of unsaturated H after elimination of diolefines, hydrogenation of the oils I and II and the fractions of oil I of up to 95, 95 - 122, 122 - 150, 150 - 175, >175°C was carried out under soft conditions (skeleton Ni-catalyst, usual temperature), as well as sulfonation before and after hydrogenation. The content of paraffins and naphthenes was determined

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SOV/81-59-9-32804

An Investigation of the Group Chemical Composition of Light Oil of Kerosene
Pyrolysis

from the anilin points of the fractions. It has been established that the content of aromatic H of unsaturated nature is 12.5 and 10.5%, aromatic H of saturated nature 71.5 and 78.5, paraffin H 3.5 and 1.6, naphthene H 3.0 and 1.4, olefines 2.5 and 3.5, cycloolefines 3.0 and 3.0, diolefines with conjugated bonds 4.0 and 1.5.

Ye. Pokrovskaya

Card 2/2

LIKHORADOV, A.P.; ENTIN, I.I.; TALAN, G.I.

Improving the quality of sinter is an important potentiality
for increasing iron production. Met. i gornorud. prom. no.1;
15-18 Ja-F '64. (MIRA 17:10)

ENTIN, I. I.

High-accuracy surveyor's NB level. Moskva, Izd-vo geodezicheskoi i kartograficheskoi lit-ry, 1953. 118 p. (Geodezicheskie instrumenty i pribory) (54-43467)

TA565.E5

DOBROKHOTOV, Yuriy Sergeyevich; TROITSKIY, Boris Vladimirovich; ~~PUTIN, I.I.~~
redaktor; VASIL'YINA, V.I., redaktor; SHLENSKIY, I.A., tekhnicheskii
redaktor [deceased]

[Manual on the use of a topographic altimeter] Rukovodstvo po rabote
s topograficheskim vysotomerom. Moskva, Izd-vo geodezicheskoi lit-ry,
1954. 79 p. (MIRA 8:4)
(Altimeter)

SUDAKOV, S.G.; ALEKSANDROV, T.F.; BAGROV, M.A.; BULANOV, A.I.; KAMENSKAYA, M.V.;
KUZ'MIN, B.S.; LITVINOV, B.A.; SINYAGINA, M.I.; TIMOFEEV, A.A.; BENTIN, I.I.;
SINYAGINA, V.I.

[Instructions for class I, II, III and IV leveling] Instruktsiia po
nivelirovaniu I, II, III i IV klassov. Moskva, Izd-vo geodesicheskoi
lit-ry, 1955. 106 p. (MIRA 9:3)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye geodesii i kartografii.
(Leveling)

ENTIN, Isay Il'ich; SINYAGINA, Vera Ivanovna; YELISEYeva, S.V., kandidat
tekhnicheskikh nauk, redakter; VASIL'YEVA, V.I., redakter;
KUZ'MIN, G.M., tekhnicheskii redakter.

[High-precision level "NB"] Vysekotechnyi nivelir "NB". Izd.2-oe
Pod obshchego red. S.V.Yeliseyeva. Moskva, izd-vo geodesicheskoi
lit-ry, 1956. 114 p. (MIRA 9:6)
(Level (Tool))

ENTIN, I.I.; INOZEMTSEVA, A.I., redaktor; KUZ'MIN, G.M., tekhnicheskii
redaktor.

[High-precision levelling.] Vysokotochnoe nivelirovanie. Moskva,
Izd-vo geodesicheskoi lit-ry, 1956. 339 p. (Leningrad. Tsentral'nyi
nauchno-issledovatel'skii institut geodesii, aerofotogrammetrii i kartografii.
Trudy, no. 111). (MLRA 9:10)

(Levelling)

ENTIN, I.I.

PHASE I BOOK EXPLOITATION

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Akademiya nauk SSSR. Komitet po geodezii i geofizike

Mezhdunarodnaya assotsiatsiya geodezii; tezis dokladov na XI General'noy assambleye Mezhdunarodnogo geodezicheskogo i geofizicheskogo soyuza (The International Association of Geodesy; Abstracts of the Reports at the XI General Assembly of the International Union of Geodesy and Geophysics) Moscow, Izd-vo AN SSSR, 1957. 63 p. 1,500 copies printed.

PURPOSE: The purpose of this booklet is the dissemination of abstracts of the reports presented by the Soviet members of the International Association of Geodesy at the XI General Assembly of the International Union of Geodesy and Geophysics.

COVERAGE: This booklet, with full English translation of the Russian text, published by The National Committee for Geodesy and

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The International Association of Geodesy (Cont.) 497

Geophysics of the Academy of Sciences of the USSR presents abstracts of reports by the Soviet members of the International Association of Geodesy at the XI General Assembly of the International Union of Geodesy and Geophysics. No personalities are mentioned. There are no references.

TABLE OF
CONTENTS:

Heyfets, M.Ye. Quartz-metal Pendulum 5

The quartz-metal pendulum is well suited for precision work and in gravity observations at sea. It is stable, comparatively unsensitive to temperature changes and to magnetic fields and does not require an elaborate support system. Its shape, size and weight, do not differ from the Sturckrat pendulum. It consists of a fused quartz stem, invar head and a lenticularly-shaped brass bob. Each pendulum is subjected to rigorous tests for strength and temperature hysteresis; static and dynamic temperature coefficients and barometric

Card 2/⁴~~12~~

The International Association of Geodesy (Cont.)

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coefficients after a lapse of years remain practically constant. The use of such a pendulum at first order stations, even under very adverse climatic conditions and transportation difficulties, is well justified.

Izotov, A.A. The Reference Ellipsoid and the Basic Geodetic Data Used in USSR

9

The reduction of triangulation to sea level and the subsequent development of it on the surface of the geoid introduce considerable distortions into the main geodetic framework. The method of projecting triangulation directly on the surface of the reference ellipsoid developed and adapted in USSR is free from such drawbacks. Krasovskiy's ellipsoid derived from measurements in USSR, W. Europe and USA offers a close enough figure of the Earth, applicable to the continents of the Northern hemisphere only.

Card 3/12
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The International Association of Geodesy (Cont.) 497

Larin, B. A. Thermal Properties of Invar Measuring Wires 12

Modern triangulation techniques require the highest degree of accuracy in measuring base lines. In the USSR, the commonly accepted 24 m. long invar or super-invar wires show little change in thermal coefficients with time, or thermal after-effects on the length of the wire. Invar wires can now be manufactured with temperature coefficients of equal value but of opposite sign.

Entin, I.I. Basis Systematic Errors in Precision Leveling 16

The systematic errors in precision leveling are vertical displacements of the markers and of the tripod, and changes in the angle between the line of sight and the bubble axis due to the effect of temperatures. Other errors caused by non-vertical position of the rods, etc. are noted, and means for correcting them are recommended. In precision leveling the computed systematic error is ± 0.05 mm per kilometer.

Card 4/12

EMIN, I. I.

"The Main Systematic Errors of High-precision Leveling" (Section II)
paper submitted at 11th General Assembly of International Union of Geodesy and
Geophysics, 3-14 Sep 57, Toronto, Canada.

C-3,800,146

~~SECRET~~
SUDAKOV, S.G.; ALEKSANDROV, T.F.; BAGROV, M.A.; BULANOV, A.I.; KAMENSKAYA,
M.V.; KUZ'MIN, B.S.; LITVINOV, B.A.; SINYAGINA, M.I.; TIMOFEEV, A.A.;
BENTIN, I.I.; pri uchastii Sinyaginoy, V.I.; BULANOV, A.I., red.;
ROMANOVA, V.V., tekhn.red.

[Instructions for first, second, third and fourth class leveling]
Instruktsiia po nivelirovaniu I, II, III i IV klassov. Izd. 2-oe,
ispr. i dop. Moskva, Izd-vo geodez. lit-ry, 1957. 106 p.

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye geodesii i
kartografii. (MIRA 11:4)
(Leveling)

ENTIN, I. I.

"Geodetic Testing of the SVV-1 Light Range Finder," by I. I. Entin and V. I. Sinyagina, Geodezia i Kartografiya, No 4, Apr 57, pp 9-17

The article gives a complete report on geodetic field tests carried out by the Central Scientific Research Institute of Geodesy, Aerophotography and Cartography (TsNIIGAik) in 1956 on the SVV-1 light range finder. This instrument is manufactured by the Scientific Research Experimental Workshop (NIEM) of TsNIIGAik according to drawings made by the Scientific Research Institute of the Military Topographic Service (NII VTS).

In the field tests, data was compiled for the purpose of increasing the accuracy of measurement control methods with the SVV-1 instrument and of establishing the possibility of using "polygonometry" in the construction of a geodetic net with a light range finder.

The article includes a drawing of a previously constructed triangulation net, on which the tests were based, and several tables which give comparative measurements and show the relative errors.

The authors state that, whereas the results of the tests were encouraging, further tests with the light range finder are necessary before a complete solution to the problem can be obtained.

It is further stated that the SVV-1 itself needs to be further improved, for example by increasing the power of the illuminating lamp, and thereby its operating distance, and by simplifying and reducing the weight of the electric power supply system. "Together with the improvement of the light range finder SVV-1, it is necessary to work persistently on the creation of a light range finder with photoelectric indication, since this extremely facilitates measurement and permits a reduction in the size of the staff."

Four photographs appear in the article: Photo No 270567 and Photo No 270568 give two views of the range finder; Photo No 270569 shows a view of the wave meter; and Photo No 270570 shows a large and one of two small reflectors. (U)

SUM IN 1451

ENTIN, I. I.

133-1-14/24

AUTHORS: Entin, I. I., and Beda, N. I., Engineers.

TITLE: Rolling According to the Theoretical Weight on the Works
imeni Petrovskiy (Prokatka po teoreticheskomu vesu na
zavode im. Petrovskogo)

PERIODICAL: Stal', 1958, No. 1, pp. 55 - 57 (USSR).

ABSTRACT: Economies obtained on works on transfer to rolling plates,
beams and angles to rolling with minus tolerances are outlined.
It is pointed out that: some increase in minus tolerances for
plates which, however, will retain the required mechanical
properties is necessary; penalties for incomplete use of wagon
capacities for small orders (20-60 tons) should be removed; a
new system of wages encouraging rolling with minus tolerances
should be developed and instruments measuring the thickness of
metal and a length counter operating during rolling should be
developed.

ASSOCIATION: Plant imeni Petrovskiy (Zavod im. Petrovskogo)

AVAILABLE: Library of Congress

Card 1/1

6-58-6-2/21

AUTHORS: Entin, I.I., Candidate of Technical Sciences, and Meshcherskiy, I.N.

TITLE: Experience Gained in the Leveling in Mountain Regions (Iz opyta nivelirovaniya v vysokogornyykh rayonakh)

PERIODICAL: Geodeziya i kartografiya, 1958, Nr 6, pp. 7 - 10 (USSR)

ABSTRACT: A precision leveling was conducted by the TsNIIGAIK in mountain regions along four short lines (totalling 10,6 km). It was intended to utilize the results of this work for the investigation of the vertical dislocations of the earth's crust. Despite difficult conditions it was required to obtain the elevations with a maximum degree of accuracy. Because of soil conditions it was necessary to use short and slender rods and the legs of the support could not be thrust into the ground too deeply. A Ni 004 level was used. This instrument is much less sensitive to heat than others without a casing. A correction was applied to the measured elevations, the calibration of the rods and in the leveling because of the gradient of air temperature. This correction was determined according to a given formula for each elevation measured during a morning or evening observation period. Besides, a correction per mean meter of elevation of each line

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Experience Gained in the Leveling in Mountain Regions 6-58-6-2/21

was applied. Experience showed, that a correction $\delta_1 h$ must be applied at great elevations and at considerable temperature differences in calibration work and in field work, or in the staking out of forward and backward lines. The factor of the linear expansion of the invar tapes must be determined experimentally. Experience showed that the problems connected with the accurate determination of the length of the rod must be investigated more closely. It is shown that it is more important for the determination of the errors of leveling to use the deviations from the arithmetic mean of the individual elevations determined in the threefold leveling. The accuracy of the leveling is satisfactory (see table). Nevertheless the inaccuracy in the determination of the correction factors $\delta_1 h$ and $\delta_2 h$ introduced a systematic error. This error can reach considerable values in long lines and with great elevations. There are 1 table and 1 Soviet reference.

1. Geophysical surveying
2. Theodolites--Performance.
3. Theodolites--Calibration
4. Mathematics

Card 2/2

SOV/28-58-6-21/34

AUTHORS: Entin, I.I., Beda, N.A., Engineers

TITLE: The Development of a Standard for Converter Steel
(Sozdat' standart na konverternuyu stal')

PERIODICAL: Standartizatsiya, 1958, Nr 6, pp 70-72 (USSR)

ABSTRACT: In the last years, the technical conditions for experimental samples of converter steel have been developed. A comparison is made here with Bessemer steel. It has been shown that the resistance, the yield and lengthening values are the same for both types. Table 2 shows that the gas content in converter steel is equal to that in open-hearth steel. The chemical composition is given in table 3. The resilience of welding seams of open-hearth steel MSt.3kp and converter steel KSt.3kp is shown in table 4. It is recommended to develop a new standard for converter steel with new designations for the different steel types.

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SOV/28-58-6-21/34

The Development of a Standard for Converter Steel

There are 4 tables and 1 set of graphs.

ASSOCIATION: Dnepropetrovskiy metallurgicheskiy zavod imeni
Petrovskogo (Dnepropetrovsk Metallurgical Plant
imeni Petrovskiy)

Card 2/2

AUTHORS: Entin, I. I., Candidate of Technical Sciences, SOV/6-58-8-2/15
~~Sinyagina, V. I., Candidate of Technical Sciences~~

TITLE: Accurate Traverse Surveying by Means of an Optical Telemeter
(Tochnaya svetodal'nomernaya poligonometriya)

PERIODICAL: Geodeziya i kartografiya, 1958, Nr 8, pp. 8-19 (USSR)

ABSTRACT: The use of the optical telemeter SVV-1 for the building-up of a geodetical frame-network of 2. and 3. order by the method of traverse surveying yielded positive results. The Central Scientific Research Institute for Geodesy, Aerial Photography and Cartography erected a network of traverse surveying of considerable size in the southern steppe-region of the Ukrainian SSSR in the summer of 1957. The major part of the points of traverse surveying coincided with the points of the network of triangulation of 2. class, which was established in 1951 by the Aerial Geodetical Organization of the Ukraine (Ref 1). The trial sample of the optical telemeter SVV-1 (1956) was improved and completed in 1957 by A. I. Demushkin, a collaborator of the aforementioned Institute. The most important improvement was the change of the system of electrical supply, which is now brought about by a

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an Optical Telemeter

SOV/6-58-8-2/15

field electrical power plant "Kiyev-2". In this way accumulators and selenium rectifiers have become superfluous and the weight of the apparatus was reduced by 160 kg. The construction of the output circuit in the high-frequency generator which feeds the Kerr-condensers was also improved. Several drawbacks discovered already in 1956 could not be removed. Improvement was also brought about by lens-mirror-reflectors (recommended already at an earlier date by V. A. Velichko and Ye. A. Chudina). They were produced at the NIEM TaNIIGAIK. The accuracy of the measuring of the length of lines is investigated, and it is shown that the measurements of distances carried out by optical means in 1957 were free from systematic errors. The angles at the points of traverse surveying were measured by means of optical theodolites Th-B Zeiss (Tseyss) and OT-02. The accuracy attained is mentioned. Balancing traverse survey by means of optical telemeters was carried out in three various ways for experimental reasons. Work was carried out by the calculating department of the Moscow Institute of Aerial Geodesy. A detailed description of this process of balancing is given and

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a number of conclusions is drawn on the basis of the tables given. The data and conclusions given in the present paper may contribute towards a further theoretical development of the structural scheme of geodetical frame-networks of 2. and 3. order in form of a traverse survey with the aid of optical telemeters as well as towards the planning of a construction of frame-networks by means of this method in open, half-open, and even in closed areas. There are 1 figure, 13 tables, and 2 references, which are Soviet.

1. Geodesics--Equipment
2. Optical instruments--Applications
3. Optical instruments--Performance
4. Mapping

Card 3/3

SUDAKOV, S.G.; ALEKSANDROV, T.F.; BAGHOV, M.A.; BULANOV, A.I.; KAMENSEAYA,
M.V.; KUZ'MIN, B.S.; LITVINOV, B.A.; SINYAGINA, M.I.; TIMOFEYEV,
A.A.; ENTIN, I.I.. Prinimala uchastiye SINYAGINA, V.I.. ROMANOVA,
V.V., tekhn.red.

[Instructions for first-, second-, third-, and fourth-order leveling]
Instruktsiia po nivelirovaniu I, II, III i IV klassov. Izd.3, ispr.
i dop. Moskva, Izd-vo geod.lit-ry, 1959. 111 p. (MIRA 13:3)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye geodesii i karto-
grafii.

(Leveling--Handbooks, manuals, etc.)

SOV/6-59-6-2/22

3(4)

AUTHOR:

Entin, I. I., Candidate of Technical Sciences

TITLE:

Establishment of Geodetic Base Nets by the Method of Traversing With Optical Range Finders (Postroyeniye opornykh geodezicheskikh setey metodom svetodальноmernoy poligonometrii)

PERIODICAL:

Geodeziya i kartografiya, 1959, Nr 6, pp 8-14 (USSR)

ABSTRACT:

At the TsNII GAIK (Tsentral'nyy nauchno-issledovatel'skiy institut geodezii, aerofotogrammetrii i kartografii) (Central Scientific Research Institute of Geodesy, Aerial Survey and Cartography), a scheme for the establishment of the geodetic base net by the method of traversing with optical range finders was worked out in two variants. The co-workers of the Moskovskoye aerogeodezicheskoye predpriyatiye (Moscow Aero-geodetic Service) took part in the calculations of accuracy in the determination of network elements and of rentability. In working out the scheme, an accuracy and density corresponding to the specifications for official geodetic networks of the USSR of 1954, and as prescribed for triangulations of 1st, 2nd, and 3rd order, were anticipated. The results obtained by the

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Method of Traversing With Optical Range Finders

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TsNIIGAIK by way of tests (Ref 1) served as initial data. The root mean square error in measuring the angle of rotation was assumed to be $\pm 1''$, and the relative error in measuring distances of 3-14 km with equal to $\pm 1 : 200,000$. Figure 1 shows the scheme of the 1st variant: the closed traverses consist of equilateral triangles. The traverse consists of 9 sides of about 8 km each. Figure 2 shows the 2nd variant: the closed traverses have the form of isosceles triangles, and consist of 10 sides with legs of 8 km and a hypotenuse of 8.5 km. - In both variants, it is assumed that the series of triangulation of 1st order serve as a base net polygonal traverses being laid along the lines of departure. The bilateral Laplacian azimuth is determined in the center of the network. The lateral lengths of 8-8.5 km are optimum values. It is shown that the continuous network of triangles with known angles and sides which is established by the polygonal traverses, is not inferior to the ordinary network of triangulation of 2nd order with respect to accuracy. On a suggestion made by the TsNIIGAIK, the Tsentral'naya vychislitel'naya shkola (Central Calculating Department) under the direction of D. A. Larin carried out an

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Method of Traversing With Optical Range Finders

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accurate determination of the influence and of the errors of the functions of balanced elements. This determination showed that the base network established by the method of polygonometry with optical range finders (according to the schemes put forward here) fully satisfies the requirements contained in the regulations for the official geodetic network of the USSR. A calculation of rentability of the method put forward here was also carried out by the TsNIIGAIK. Calculations for two big sections were carried out: one section was situated in open flat country, the second in a half-closed area of raggedness. The calculations showed that in the case of open flat country the triangulation method is, on the whole, 66% more expensive than the method described here. In case of the half-closed area of raggedness, the method shown here is also somewhat more efficient than the triangulation method. In a number of cases, it is convenient to use both methods. The networks established by the method put forward here are more uniform with respect to accuracy than the continuous networks of triangulation of 2nd and 3rd order. There are 2 figures, 3 tables, and 1 Soviet reference.

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4

AUTHOR3: Larin, B. A., Candidate of Technical Sciences, Nazarov, V. M., Candidate of Technical Sciences, Prilepin, M. T., Candidate of Technical Sciences, Entin, I. I., Candidate of Technical Sciences, Genike, A. A., Lazanov, P. Ye., Mikhaylov, V. S., Shevelev, A. P. S/006/60/000/04/018/019
B007/B005

TITLE: On the Book by A. V. Kondrashkov, "Electrooptical Range Finders"

PERIODICAL: Geodeziya i kartografiya, 1960, Nr 4, pp 73-76 (USSR)

TEXT: This is a review of the book by A. V. Kondrashkov (Ref, Footnote on p 73) published in 1959. It is thoroughly discussed as far as it first tries to generalize and systematize the data required for optical range finders. The book consists of two parts. The first part (60% of the volume) gives data from physics, radio engineering, electrical engineering, and electronics. The second part deals with problems directly connected with optical range finders. The incoherent data of varying level on the fields mentioned in the first part are too extensive and inconvenient. The division and mode of representation of these chapters is also a failure. The theory of optical range finders is not well explained. Several concrete mistakes of the book are pointed out. The great number of such mistakes

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On the Book by A. V. Kondrashkov, "Electrooptical
Range Finders"

S/006/60/000/04/018/019
B007/B005

reduces the value of the book considerably. It is regretted that the editor of
the book Yu. V. Popov paid his principal attention to the title, not to the
contents of the book, as can be seen from the introduction. There is 1 Soviet
reference.

Card 2/2

MESHCHERSKIY, I.N.; ENTIN, I.I.

Study of the NB-4 level. Geod.1 kart. no.4:32-34 Ap '62.
(MIRA 15:12)
(Level (Surveying instrument)--Testing)

RUBINSKIY, P.S., inzh.; ENTIN, I.I., inzh.

Making 35GS steel in oxygen-blown converters. Met.i gornorud.
prom. no.5173-75 S-O '62. (MIRA 16:1)

1. Zavod imeni Petrovskogo.
(Steel—Metallurgy)
(Oxygen—Industrial applications)

MESHCHERSKIY, I.N.; ENTIN, I.I.

Leveling errors caused by the use of invar rods. (MIRA 15:9)
Trudy TSNIIGAIAK no.147:65-91 '62.
(Leveling)

SUDAKOV, S.G.; ALEKSANDROV, T.F.; BAGROV, M.A.; BULANOV, A.I.;
KAMENSKAYA, M.V.; KUZ'MIN, B.S.; LITVINOV, B.A.; SINYAGINA,
M.I.; TIMOFEYEV, A.A.; ~~ENTIN, I.I.~~ Prinsipal uchastiye
SINYAGINA, V.I.; KOMAR'KOVA, L.M., red.izd-va; ROMANOVA,
V.V., tekhn. red.

[Instructions for 1st, 2d, 3d, and 4th-class leveling] In-
struktsiia po nivelirovaniu I, II, III, i IV klassov. 4 izd.
dop. i ispr. Moskva, Gosgeoltekhizdat, 1963. 110 p.
(MIRA 16:6)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye geodezii i
kartografii. (Leveling)

GENIKE, A.A.; ENTIN, I.I., red.; KOMAR'KOVA, L.M., red. izd-va; ROMANOVA,
V.V., tekhn.red.

[Geodetic phase tellurometers.] Moscow. Tsentral'nyi nauchno-
issledovatel'skii institut geodezii, aerofotogrammetrii i kartografii.
Geodezicheskie fazovye radiodal'nomery. Moskva, Gosgeoltekhizdat,
1963. 112p. (its Trudy, no.164) (MIRA 16:10)

ENTIN, I.I., kand.tekhn.nauk; MESHCHERSKIY, I.N.

Determination of vertical displacements of the earth's crust in
the Surkhob Valley. Trudy TSNIIGAIK no.154:91-106 '63.
(MIRA 16:9)

(Surkhob Valley—Earth movements) (Leveling)

AL 10714-66 ENT(1)

ACCESSION NR: AP5023484

UR/0006/65/000/009/0017/0021

UDK.528.389

AUTHOR: Entin, I.I.; Meshcherskiy, I.N.

TITLE: Repeated levellings in the river Surkhob valley

SOURCE: Geodeziya i kartografiya, no. 9, 1965, 17-21

TOPIC TAGS: geodetic survey, geodetic instrument, geodesy

ABSTRACT: Repeated high precision levelling surveys were made by the TsNIIGAIK in the active seismic region of the shores of the river Surkhob, between the mountain ranges of Peter the Great (north), and Gissarsky (south of the river) in the high mountains region of the Tadzhik SSR, in cooperation with the Institute of Earth Sciences, A.N., USSR. The aim was to develop methodology for the precise evaluation of relative vertical movements of the earth's surface. Six repeated levellings were made during the years 1957-1961 and in 1964, based on two benchmark networks on both shores of the Surkhob river. Evaluation of the results showed that the relative vertical velocities of the surface were constant on all survey lines except one, a situation permitting a good estimate of levelling precision. For a numerical

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ACCESSION NR: AP5023484

estimate of levelling precision, a reduction of the levelling data to a single initial levelling epoch was made first, solving a system of simultaneous linear equations established by equating the most probable superelevations with the differences between the observed superelevations and products of epoch time(years) and the most probable vertical velocity. The results were used for the determination of the RMS summary error of the double levelling process, per kilometer of the traverse. This error was found to be: plus or minus .49 millimeters/kilometer. A lifting of the Peter the Great range with respect to the Gissarskiy range has been found, perturbed by large local movements. The methodology was found suitable for studies of vertical movements of the earth's surface in high mountains, where the conditions for levelling surveys are particularly difficult. The orig. art. has: 2 figures, 1 table and 5 formulas.

ASSOCIATION: T&NIIGAIAK

SUBMITTED: 00

ENCL.: 00

SUB CODE: 08

NO REF SOV: 001

OTHER: 000

Card 2/2 *pu*

ACC NR: AT6011150 SOURCE CODE: UR/3197/65/000/002/0237/0260

AUTHOR: Entin, I. I.; Meshcherskiy, I. N.

ORG: Central Scientific Research Institute of Geodesy, Aerial Surveying and Cartography (Tsentral'nyy nauchno-issledovatel'skiy Institut geodezii, aeros'yemki i kartografii)

TITLE: Vertical movements of the earth's surface in the Surkhob River Valley

SOURCE: AN EstSSR. Institut fiziki i astronomii. Sovremennyye dvizheniya zemnoy kory. Recent crustal movements, no. 2, 1965, 257-260

TOPIC TAGS: epeirogeny, geodetic leveling, repeated leveling, high precision leveling, crustal deformation, aerial survey, cartography / Surkhob River

ABSTRACT: An analysis is made of values derived from high-precision leveling repeated annually over the 5-yr period 1957-1961 and in 1964 by the Central Scientific Research Institute of Geodesy, Aerial Surveying, and Cartography (TsNIIGAIK) in the Nemich and Garm sections of the Surkhob River. It is shown that the Peter I Range rose in both areas in relation to the Gissar Range. In the Nimich section, the rate approaches 1 mm/yr and is slightly greater in the western than in the eastern section. In the Garm section, the rates of rise of the Peter

Card 1/2

ACC NR: AT6011150

Range in the western and eastern areas are 2—3 mm/yr and 11.5 mm/yr, respectively, a significant difference. During the period 1957—1964, the rate and direction of movements remained essentially unchanged in all areas except one, the western part of the Garm section. Orig. art. has: 1 table. [SI]

SUB CODE: 08/ SUBM DATE: none/ ORIG REF: 001

Card 2/2

ZOLOTUKHIN, N.M.; ENTIN, I.Z.

Optical polarization for the study of deformations in
three-dimensional plastically-deformed plexiglas models.
Kuz.-shtam. proizv. 5 no.10:10-13 0 '63. (MIRA 16:11)

ZOLOTUKHIN, N.M.; ENTIN, I.Z.; GETMANSKIY, A.P.

Investigating the distribution of plastic deformations by the
photoplasticity method. Izv. vys. ucheb. zav.; chern. met. 8
no.5:76-81 '65.
(MIRA 18:5)

1. Kramatorskiy industrial'nyy institut.

L 09122-67 EWT(d)/EWT(m)/EWP(w) IJP(a) EM 38
 ACC NR: AP6032139 SOURCE CODE: UR/0121/66/000/007/0019/0021
 AUTHOR: Dolgov, V. A.; Basik, V. S.; Entin, I. Z.; Yefimov, A. N.; Polyakov, Ye. Ye.
 ORG: None
 TITLE: Studying the stressed state of machine tool frame members by the photoelastic method 26
 SOURCE: Stanki i instrument, no. 7, 1966, 19-21
 TOPIC TAGS: photoelasticity, stress analysis, machine tool
 ABSTRACT: The authors use the optical method for studying the stressed state of roll-turning lathe beds. This method can also be used for studying the overall stressed state of such a machine. This method makes it possible to determine experimentally the isoclinic parameter and main tangential stresses at a given point in the two-dimensional model of a cross section of the frame and to evaluate normal stresses on unloaded contours. "Stress division" is used to determine normal stresses at points lying within the cross section contour with respect to the isoclinic parameter and the main stress differences. This method is very useful for the experimental determination and selection of the optimum shape for the cross section of the bed. Orig. art. has: 3 figures.
 SUB CODE: 13/ SUBM DATE: None/ ORIG REF: 004 UDC: 621.9-216.6:539.319.001.5
 Card 1/1 nst

STROGANOV, G.B.; SHNEYDER, S.A.; ENTIN, L.Kh.

Device for checking the gas saturation of cast aluminum alloys.
Zav. lab. 31 no.8:1030 '65. (MIRA 18:9)

ACC NR: AF7003225

SOURCE CODE: UR/0056/66/051/006/1852/1855

AUTHOR: Magarill, L. I.; Entin, M. V.

ORG: none

TITLE: On the shape of the electron energy spectrum in a one-dimensional random lattice

SOURCE: Zh eksper i teor fiz, v. 51, no. 6, 1966, 1852-1855

TOPIC TAGS: electron energy level, electron spectrum, statistic distribution, potential well

ABSTRACT: The article deals with the energy spectrum of an electron in a one-dimensional system of randomly distributed potential centers, the distance between which have a Poisson distribution. The product of the magnitude of the potential by the average distance between centers is assumed to be small. It is pointed out that none of the earlier investigations of such a system lead to an analytic expression for the level density in the entire energy region. No limitations are imposed on the energy. The distribution of the potential wells is established for both repulsive and attractive potentials and the case of negative electron energy is discussed. The calculation results are compared with earlier published data. The authors thank V. L. Pokrovskiy for guiding the work. Orig. art. has: 10 formulas.

SUB CODE: 20/ SUBM DATE: 23Jun66/ ORIG REF: 003/ OTH REF: 001

Card 1/1

ENTIN, R. I. and KURDYUMOV, G. V.

"Temper Brittleness of Structural Steels," Metallurgizdat, 1945

ENTIN, R. I.

Influence of Titanium and Combined Additions of Boron, Vanadium, and Titanium on the Crystallization of Steel. V. E. Neimark, L. B. Piletskaya, and R. I. Entin. Henry Bratcher (Altadena, Calif.), Translation No. 2238, 1948, 14 pages, From Stal (Steel), v. 8, no. 3, 1948, p. 248-254.

Describes effect of additions of 0.03-0.1% titanium and combined additions of 0.003% boron, 0.05-0.06% vanadium, and 0.03-0.04% titanium upon primary crystallization, kinetics of isothermal decomposition of austenite, and hardenability of carbon steel containing 0.45-0.55% and 0.8-1.0% C, respectively. Includes tables, graphs, and photos.

ENTIN, R.I.

KOGAN, L.I.; MEYMARK, V.Ye., kand.fiz.-mat.nauk; PILETSKAYA, I.B.;

ENTIN, R.I., kand.tekhn.nauk

Effect of certain small addition elements on steel crystallization and
recrystallization processes. Probl.metalloved.i fiz. met. no.[1]:225-274
'49. (MIRA 11:4)

1.Laboratoriya fazovykh prevrashcheniy i Laboratoriya kristallizatsii
TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii.
(Steel alloys--Metallography)
(Solidification)

ENTIN, R.I., kand.tekhn.nauk

Causes of the influence of alloying elements on the kinetics
of isothermic dissociation of austenite. Probl.metalloved, 1 fiz.
met. no.[1]:275-306 '49. (MIRA 11:4)

1.Laboratoriy fazovykh prevrashcheniy TSentral'nogo nauchno-
issledovatel'skogo instituta chernoy metallurgii.
(Steel alloys--Metallography)
(Austenite)

ENTIN, R. I.

USSR/Metals - Alloys

Physics - Decomposition, Isothermic

"Principles Governing the Influence of Molybdenum of the Kinetics of Isothermic Decomposition in Austenite," B. Yu. Mett, R. I. Entin, Inst of Metallophys, Gen Sci Res Inst of Ferrous Metals, 8 pp

"Dok Ak Nauk SSSR" Vol LXVIII, No 4, 1949

Establishes that in steel with 0.7% molybdenum, course of austenite decomposition is initially connected in the interval of temperatures of pearlite conversion with the formation of a special molybdenum carbide. Initial stage of decomposition involves diffusion of Mo explains strong influence of molybdenum in retarding decomposition of austenite. However, at temperatures around the conversion of austenite (below 570°), decomposition of austenite is not related to diffusion of molybdenum, since cementite containing molybdenum is formed. Submitted by Acad I. P. Bardin 23 Jul 49.

PA 150T54

Evaluation B-60429

2

CA

Kinetics of recrystallization of alloyed iron. L. I. Kogan and N. I. Eskin. *Zhur. Tekh. Fiz.* 36, 689-93 (1961). --By X-ray patterns the temp. of beginning and recovery of Armon iron cold-rolled by 60-65%, and annealed for 10-20 min., is 520°. Under the same conditions, the same iron with 2% Ni has a recryst. temp. of 510°, with 0.1% C or 2% Si or 1% Mn, 500°, with 5% Co 475°, with 2% Cr 680°, with 1.5% W 655°, and with 5% Mo 680°. On annealing at 570-6°, Armon iron, unalloyed or alloyed with Ni, Mn, or Si, begins to recrystallize after 1-3 min., with 5% Co after 3-10 min., and with 2% Cr after 3-5 hrs.; with 1.5% W or 2% Mo, recryst. even at 600-10° begins only after 2-4 hrs. If the log of the length of time elapsing until the beginning of the recryst. is plotted against 1/T, the plot is a straight line in all cases, and permits calcn. of an activation energy H for the rate of recryst.; for unalloyed Armon iron, $H = 45-55$, with 2% Ni 50-70, with 0.1% C 75-85, with 1% Mn 80-90, with 1.5% W 85-90, with 2% Mo, Cr, or Co, 100-120, with 2% Si 110-120 kcal./g. atom. The values of H for iron is fairly close to the activation energy of self-diffusion. The activation energies for recryst. of Cu and for its self-diffusion, calcd. from literature data, are equally very close. If the amt. of the alloying elements added to iron are expressed in at. %, their effects on the rate of recryst. are found to increase in the order Cr, Co, Mo. W.

N. Thon

CA ENTIN, R.I.

Effect of alloying elements on the kinetics of the $\gamma \rightarrow \alpha$ transition in iron. L. I. Kogan and P. J. Ertel. *Zhur. Tekh. Fiz.* 20, 1043-63 (1950); cf. C.A. 44, 87918. The rates of the isothermal $\gamma \rightarrow \alpha$ transition, at temps. below the A_1 temp., were detd. below the Curie point of α (768°), by the angle of rotation of cylindrical 3.5×25 mm. samples in a magnetic field; this method permitted detection of as little as 0.5% of α -phase. Above 768°, the amt. of α formed could, in some cases, be estd. from micrographs of quenched samples, by the amt. of the acicular martensitic structure. With tech. iron (C 0.04, Mn 0.25, Ni traces, $A_1 = 900^\circ$), the rate of conversion increases with falling temp. At 720°, conversion begins only after 8-9, and the half-conversion

time $\tau_{50} = 14$ sec.; the conversion is not yet completed in 20 sec. At 680-70°, the time necessary for the conversion to begin is comparable with the time necessary for the sample to acquire the temp. of the bath, i.e. the conversion is so more strictly isothermal. Plots of the time τ necessary to attain a stated degree of conversion (5, 25, 50% of α -phase) as a function of the temp., for an alloy Fe + 8% Cr ($A_1 = 855^\circ$), show a max. of the rate of conversion at 720°. At 780°, conversion begins after 1 min., and is not completed before 1 hr.; at 800°, completion is not yet attained in 4 hrs. The conversion isotherms at 300 and 400° are martensitic in character, i.e. involve no incubation period, and the conversion is completed rapidly. At 800 and 600°, conversion is rapid up to about 80%, then it is

slowed down. Fe + 7% Cr ($A_1 = 835^\circ$) shows max. rate of conversion at 720-40°; at 620, 600, and 500°, conversion is rapid only up to a point (e.g., 40-45% at 600°), then becomes very slow; at 300 and 400°, the kinetic curves are martensitic-like. Fe + 8.5% Cr ($A_1 = 815^\circ$) shows max. rate of conversion at 670-710°. Kinetic curves in the range 700-630° are normal. At 600 and 500°, the conversion is very slow; at 600°, it begins only after 3 min., and 25% conversion takes 40 min.; at 535°, conversion begins after 3 hrs. The kinetic curves at 375, 400, and 415°, are martensitic-like; the degrees of conversion attained at 415, 400, 375, and 200°, are, resp., 9, 30, 48, and 100%. The velocity of the $\gamma \rightarrow \alpha$ conversion in Fe + 2.3% Ni ($A_1 = 770^\circ$) at 600° and above is considerably lower than in Fe., and about the same as in Fe in the range 600-500°; at 680°, in 30 sec., the conversion in the alloy is 35%, as against 97% in Fe. In Fe + 1.4% W, in the range 715-480°, the conversion is slower than in Fe, despite the higher $A_1 = 955^\circ$; at 480-500°, only 50% are converted in 11 sec.; the incubation periods at 670 and 715° are, resp., 15 and 30 sec., as against 5 and 10 sec., resp., in Fe. In Fe + Co, 2, 5, and 80% ($A_1 = 805, 805, \text{ and } 970^\circ$, resp.) the rate of conversion is increased as compared with Fe; at 720°, in 5 sec., the conversion attains 27, 87, and ~87%, whereas no conversion is noticeable as yet in Fe. In Fe + 0.9% Mo, the rate of conversion is about the same as in Fe. Fe + 1% Cr + 2.3% Ni shows max. rate at about 680°; the curves at 300 and 400° are martensitic-like. Whereas addn. of Ni alone lowers the rate of conversion considerably at 680° but hardly at all at 620°, simultaneous presence of Ni and Cr results in low rate both at 600 and at 620°. Fe + 1.2% Cr

over

PA 175T89

ENTIN, R. I.

USSR/Physics - Austenite
Chemistry - Carbide

21 May 50

"Carbide Formation During Isothermic Decay of Austenite in Chrome Steels," B. Yu. Mett, R. I. Entin, Inst Metallophys, Cen Sci Res Inst Ferrous Metals

"Dok Ak Nauk SSSR," Vol LXXII, No 3, pp 497-500

Discusses results of actual investigations into processes of carbide formation for the case of austenite decay in steels alloyed with chrome. Concludes that in chrome steels, in definite region of temp following immediately after the A_1 -point, beginning of austenite decay is connected with formation of stable carbide. Submitted 24 May 50 by Acad I. P. Bardin.

175T89

CA

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Kinetics of the polymorphic transformation in alloyed iron. L. I. Kogan and R. I. Bogdanov. *Doklady Akad. Nauk S.S.S.R.* 73, 1173-4 (1960); cf. *C.A.* 44, 8751k. An expl. study was made of the subcrit. gamma to alpha transformation of Fe alloys contg. about 0.04% C and more than 5% total alloying elements. The alloys contained Cr; Cr and Ni; Cr, Ni, and Mo; and Cr and Co. In Fe-Cr-Ni alloys the temp. dependence of the transformation is controlled by the work of nucleus formation, which is increased by Ni, and by the activation energy of the transformation process, which is increased by Cr. Data were obtained by photographically recording magnetometer readings. The addn. of 2.5% Ni to an 8.5% Cr alloy increased the time for 5% isothermal transformation at the knee from 1 to 20 min. The time for half reaction at 600° is 7-10 sec. in Fe; in a 2.5 Ni alloy, 14-15 sec.; in a 7 Cr alloy, 35-40 sec.; in a 7 Cr, 2 Ni alloy, 10 min. Effects of alloys are not additive. The temp. of the crit. point does not greatly affect the transformation rate. The addn. of 5% Co to the 8% Cr alloy also increases the time for 5% transformation at the knee. Addns. to Fe of Cr, Cr-Mo, and Cr-Co increase the stability of the gamma phase at temps. below the knee, and hence increase the activation energy of transformation. Addns. to Fe of Cr-Ni increase both the activation energy and the work of nucleus formation. A. G. Guy

1957

Entin, R. I.

MENT, B.Yu.; ENTIN, R.I., kand. tekhn. nauk.

Reasons of the effect of molybdenum on kinetics of isothermal
dissociation of austenite. Probl. metalloved. i fiz. met. no.2:
188-192 '51. (MIRA 11:4)
(Iron-molybdenum alloys--Metallography)

E N T I N, R. I.

MENT, B.Yu.; ENTIN, R.I., kand. tekhn. nauk

Carbide formation during isothermal dissociation of austenite
in chromium steels. Probl. metalloved. i fiz. met. no.2:193-203
'51. (MIRA 1E:4)
(Chromium steel--Metallography)

ENTIN R.I.

KOGAN, L.I.; ENTIN, R.I., kand. tekhn. nauk.

Kinetics of polymorphous transformations of alloyed iron. Probl.
metalloved. i fiz. met. no. 2:204-215 '51. (MIRA 11:4)
(Iron alloys—Metallography) (Polymorphism)

ENTIN, R.I.

KOGAN, L.I.; ENTIN, R.I., kand. tekhn. nauk.

Kinetics of the recrystallization of alloyed iron. Probl. metalloved.
1 fiz. met. no. 2:216-221 '51. (MIRA 11:4)

(Iron alloys—Metallography) (Solidification)

U S S R .

✓ The intermediate transition of austenite. R. L. Eskin.
Doklady Akad. Nauk S.S.S.R. 79, 973-4 (1951); G. V. D.
Sadovskii, Trudy Ural. Filial. Akad. Nauk, (Sverdlovsk),
1945. — The isothermal decompn. of austenite has two max.
for the rate of decompn. for steel alloys with Mo, Cr, or
W. One max. lies below the temp. interval 450-480° (the
transition region) and the other above it. A study of car-
bide formation shows that in all cases (Cr, Mo, or W)
cementite is formed in the transition region. The kinetics
of the $\gamma \rightarrow \alpha$ transition was studied in the transition region.
J. Royat Leach

ENTIN, R. I.

3

Effect of elements, forming low-solubility carbides, on the decomposition of austenite. [I. Kovay and R. I. Entin] *Dokl. Akad. Nauk SSSR*, 1954, 94, 893-896. When steel contains Mn (~2%), Ti, Nb, Ta, and V (which form carbides sparingly soluble in austenite) dissolve in austenite on heating and lengthen the induction period for its decomposition in the pearlite range on cooling, since this is determined by the time required for them to diffuse out of the lattice. R. C. MURRAY. / MF

Evaluation B-77863

ENTIN, R.I.

Category : USSR/Solid State Physics - Phase Transformation in
Solid Bodies

E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6619

Author : Entin, R.I.

Title : On Processes of Carbide Formation in Isothermal Decomposition
of Alloyed Austenite.

ENTIN, R. I.

Category : USSR/Solid State Physics - Phase Transformation in
Solid Bodies

E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6619

Author : Entin, R. I.

Title : On Processes of Carbide Formation in Isothermal Decomposition
of Alloyed Austenite.

Orig Pub : Probl. metalloved. i fiz. metallov, sb. 4, 1955, 239-250

Abstract : The structure of the carbide phase in molybdenum, cobalt-molybdenum, and tungsten steels was investigated during the process of transformation at temperatures of the pearlitic and intermediate regions, also after special binary treatments. The experimental data confirmed the remarks previously made by the author concerning the fact that the decomposition of the austenite in the pearlite temperature region in steels alloyed by carbide-forming elements is due to the formation of a carbide phase that is enriched with these elements, and consequently to a diffusion redistribution of the alloying elements. In the intermediate region, the transformation of austenite is not connected with the diffusion of the alloying elements.

ENTIN, R. I.

Category : USSR/Solid State Physics - Phase Transformation in
Solid Bodies

E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6618

Author : Kogan, L.I., Entin, R.I.

Title : Effect of Elements that Form Difficulty-Soluble Carbides
on the Decomposition of Austenite.

Orig Pub : Probl. metalloved. i fiz. metallov. sb. 4, 1955, 251-286

Abstract : When hardening from ordinary heat treating temperatures (900 -- 1000°), the presence of such strongly-carbide-forming elements as Ti, V, Zr, Nb, and Ta reduces the hardenability of the carbon steel, owing to the formation of quite stable carbides by these elements. A partial transformation of these carbides into austenite when heating to 900 -- 1000° can be accomplished by alloying the steel with manganese (1.5 -- 2.5%). In this case, addition of titanium to manganese steel increases considerably the stability of the austenite in the pearlite and intermediate regions. Alloying with titanium also leads to a sharp isolation of the pearlite and middle

Cerd : 1/2

Category : USSR/Solid State Physics - Phase Transformation in
Solid Bodies

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Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6618

regions of transformation of the austenite. The same effects are observed in steels containing 0.26 and 0.4% carbon. The maximum increase in the stability of austenite is observed when approximately 0.1 and 1% titanium is introduced. Approximately the same laws are observed when alloying manganese steels with zirconium, vanadium, niobium, and tantalum. Analogous effect, but to a smaller degree, are observed also in chromium and chromium-manganese steels alloyed with strongly-carbide-forming elements. The introduction of manganese to carbon steel increases the amount of titanium and vanadium in the solid solution as it is heated during hardening. In the decomposition, in this case, a greater amount of these elements is transformed in the pearlite region from austenite into carbide, and this indeed causes the increased stability of the austenite (the same as if it were alloyed with such carbide-forming elements as Mo, V, and Cr),

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ENTIN, R.I.

Category : USSR/Solid State Physics - Phase Transformation in
Solid Bodies

E-5

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6617

Author : Tsivinskiy, S.V., Kogen, L.I., Entin, R.I.

Title : Radioactive Tracer Investigation of the Distribution of
Chromium and Tungsten During the Process of Austenite Decay

Orig Pub : Probl. metalloved. i fiz. metallov, sb. 4, 1955, 277-295

Abstract : The method of radioactive isotopes was used to determine the contents of Cr and V in the carbide phase in steels with 1.18% C and 2.42% Cr and with 1.02% C and 0.78% W respectively in the process of transformation of austenite at the temperatures of the pearlite and intermediate regions. In the process of decomposition in the pearlite region, the contents of the alloying elements in the carbides exceed their contents in steel by a factor of 3 -- 5 times. The results obtained prove that the decomposition of the austenite in the pearlite region is connected with the need for diffusion redistribution of the tungsten. It is shown that rate of secondary diffusion

Cerd : 1/2

Category : USSR/Solid State Physics - Phase Transformation in
Solid Bodies

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Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6616

from the critical to a certain boundary dimension the speed of the process is determined by the kinetics of the rearrangement of the iron lattice. At large dimensions of the center, the kinetics of the displacement of the phase boundary are determined by the speed of the diffusion of carbon. In this case, the values of the quantity considered turned out to be smaller than expected from experimental data (Dokl AN SSR, 1948, 60, 795). An analogous result is also obtained in a theoretical analysis of the speed of the isothermal growth of the pearlite center (Zh. tekhn. fiziki, 1950, 20, 872). If account is taken of the effect of the stresses occurring during the transformation process, the theoretical results and the experimental results are brought closer together. (Aleksandrov L.N., Lyubov B.Ya., Dokl. AN SSR, 1950, 74, 1081).

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ENTIN, R.I.

KURDYUMOV, G.V., akademik; ENTIN, R.I., doktor tekhn.nauk; ROZENBERG, V.M.,
kand.tekhn.nauk

Relation of the kinetics of weakening during the aging process to the
composition of the hardening phase. Probl. metalloved. i fiz. met.
no.4:360-376 '55. (MIRA 11:4)
(Metals--Hardening) (Crystal lattices)

SOV/123-59-15-59754

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 15, p 122 (USSR)

AUTHORS: Kogan, L.I., Entin, R.I.

TITLE: On the Theory of Intermediate Austenite Transformation

PERIODICAL: V sb.: Materialy Nauchn.-tekhn. konferentsii po probl. zakalki v goryachikh sredakh. I. Yaroslavl', 1957, pp 3 - 28

ABSTRACT: Unlike the normal pearlite transformation, in the process of intermediate austenite transformation (IAT) an acicular relief is obtained, a consequence of the regular, orderly shifting of atoms at the boundary of coherent phases, which proves the martensite character of the γ - α transformation in the medium region. The IAT is not connected with a diffusional redistribution of alloying elements. From the change in the crystal lattice spacing it was established that in medium-carbon steels (of the 54Kh3, 48G4, 30Yu3 grades) the concentration of C in the residual austenite (RA) increases at the IAT, in highcarbon steels (of the 144Kh3, 118G3, 139G2 grades) it decreases, but in steels with a C-content of 0.8 - 1.0% it does not change. The sections of austenite with a C-concentration can, at the IAT, be transformed into carbides at varying rate, which depends on the initial concen-

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On the Theory of Intermediate Austenite Transformation

tration of C and the components. In steels with a high concentration of C the forming of carbide starts in the early stages of the IAT; in steels with a C-content of 0.5 - 0.6% the process of carbide formation is intensified, depending on the components, in the following order (increasing): Si, Mn, Cr, Ni. Depending on the temperature of the IAT, on the initial concentration of C and on the alloy composition of the steel, either elimination of C will prevail in the RA or a separation of carbides from the RA. The degree of a change of concentration of C at the IAT is the higher, the higher the temperature of transformation. During the process of IAT carbon is distributed irregularly within the RA. The redistribution of C at the IAT precedes the γ - α transformation and leads to a concentration of carbon in the RA, or to a separation of carbide from the austenite or to a combination of both these processes. The martensite point of the sections, which are adjacent to the products of the IAT, increases when the concentration of C in the RA is reduced. The self-deceleration of the IAT process at a constant temperature is not connected with the formation of RA, concentrated by C, but is a result of the martensite mechanism of the γ - α transition. The mechanism of IAT is the same in the upper and lower parts of the medium region. 13 figures, 20 references.

F.M.A.

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ENTIN, R.I.

137-58-5-10592

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 246 (USSR)

AUTHORS: Gruzin, P.L., Kurdyumov, G.V., Tyutyunik, A.D., Entin, R.I.

TITLE: On the Role of Diffusive Displacements of Atoms in High-temperature Strength (O roli diffuzionnykh peremeshcheniy atomov v zharoprochnosti)

PERIODICAL: V sb.: Issled. po zharoprochn. splavam. Vol 2. Moscow, AN SSSR, 1957, pp 3-8

ABSTRACT: Some results of investigations of diffusion (D) in metals and alloys relative to the problem of high-temperature strength (H) are examined. It is noted that the special features of the behavior of metals at high temperatures under load are conditioned by the existence of rather frequent diffusive shifts of atoms (A) in the crystal lattice of the phases constituting the alloy. Therefore, along with the shear mechanism of plastic deformation, a diffusion mechanism becomes active. The number of atomic displacements, increasing with temperature, tends to limit the temperature zone in which hardened alloy phases may be employed, owing to the reduction in the resistance to plastic deformation due to the shear mechanism. The relatively higher A

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137-58-5-10592

On the Role of Diffusive (cont.)

mobility at the grain boundary or the intra-grain interface, as against that within the body, means that the grain boundaries constitute the weak spot in the resistance of a metal to deformation and failure at high temperatures. A reduction in the mobility of the A is required to increase the level of H. It is demonstrated that an identical level of mobility of the A can be attained at different temperatures with different metals. The temperature at which a given level of diffusive mobility of A is attained is determined primarily by the energy of activation. In some metals the level of mobility of the A is also significantly shifted by the change in the magnitude of the factor D_0 preceding the exponent in the expression for the relationship between the coefficient of diffusion (CD) and the temperature. Accumulated experimental data show that a variation in the CD may occur owing to changes in either parameter of the temperature dependence of the CD. At elevated energies of activation (due to alloying), there is usually an increase in the multiplier D_0 , with the result that at temperatures that are high for the given alloy base metal there is little change in the CD, while at low temperatures they may change by a full order of magnitude or even more. Addition to the alloy of elements that strengthen the bond in the solid solution causes a shift toward higher temperatures for the onset of the diffusive ductility mechanism.

V. N.

1. Metals--Diffusion 2. Alloys--Diffusion 3. Metals--Temperature factors
Card 2/2 4. Metals--Mechanical properties

Entin, R.I.

AUTHORS: Kogan, L.I. and Entin, R.I.

126-2-24/30

TITLE: Redistribution of carbon during transformation of austenite in the medium range. (Pereraspredeleniye ugleroda pri prevrashchenii austenita v sredney oblasti).

PERIODICAL: "Fizika Metallov i Metallovedeniye" (Physics of Metals and Metallurgy), Vol.IV, No.2, 1957, pp.360-368 (USSR).

ABSTRACT: Recent experimental data enable to characterise as follows individual elementary processes which bring about austenite transformation in the medium range of temperatures: the austenite transformation takes place without any appreciable redistribution of the alloying elements; this follows from numerous results of analysis of the structure and composition of the carbide phase which indicate that, apart from the dependence on the structure of the equilibrium carbide phase, cementite forms in the medium temperature range, the content in alloying elements of which corresponds approximately to their average content in the steel (6 to 8). Measurement of the period of the crystal lattice of the austenite indicates that transformation in the medium temperature range is linked with redistribution of the carbon (9 to 11); intermediate transformation can be linked with enrichment as well as with impoverishment in carbon of the residual austenite. Austenite transformation in the medium temperature

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Redistribution of carbon during transformation of austenite in the medium range. (Cont.) 126-2-24/30

range is accompanied by the formation of a characteristic relief on the polished surface of the cut and this indicates a regular character of the displacements of the atoms at the phase boundary and a coherence of the phases (11-13). Formation of a relief during the transformation is characteristic both for alloy and for carbon steels (11). It was also shown by Kogan(16) that even in practically carbon free iron alloys alloyed with various elements, the γ to α transformation at temperatures below 500 - 400 C can take place only as martensitic transformations. All these data indicate that austenite transformation in the medium temperature range represents a martensite mechanism of γ to α transformation and therefore austenite transformation in the medium temperature range has to be interpreted as a combination of the processes of diffusion redistribution of carbon in the austenite and of a martensitic γ to α transformation in sections of the austenite with reduced carbon concentrations. In this paper experimental results are given on the character of the process of carbon redistribution as a function of the steel composition (content of C and of alloying elements) and also the results obtained

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Redistribution of carbon during transformation of austenite in the medium range. (Cont.) 126-2-24/30

of the changes in the carbon concentration in the austenite as a function of the temperature and duration of transformation of the austenite in the medium temperature range. The lattice period of the austenite after its partial transformation in the medium temperature range was measured for a number of steels, the chemical compositions of which (for 12 steels) are entered in Table 1, p.361. In para.1 the change of the average period of the austenite lattice as a function of transformations in the medium temperature range is studied on steel specimens with an approximately equal chromium content (3.45, 3.15 and 3.54%) but differing carbon contents (1.44, 0.98 and 0.54%). In para.2 the same relations are studied for the steels 118F3 (1.18% C, 3.58% Mn) and 48F4 (0.48% C, 4.33% Mn). In para.3 the same relation was studied on the steels 30X2 (0.3% C and 2.9% Al) and 79X2 (0.79% C and 2.86% Al). In para.4 the changes in the lattice period of the residual austenite are compared for partial transformations in the medium temperature range for steels with approximately equal carbon contents. The authors arrive at the following conclusions: in the case of alloying with Cr, Mn and Ni the

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Redistribution of carbon during transformation of austenite in the medium range. (Cont.) 126-2-24/30

degree of carbon enrichment of the residual austenite as a result of the austenite transformation in the medium temperature range depends fundamentally on the carbon content of the steel. The degree of change of the concentration of carbon in the austenite (for increasing as well as decreasing C contents) will be the higher, the higher the transformation temperature in the medium range. For steels for which carbon enrichment of the residual austenite is a characteristic feature, the curves of the changes of the lattice period of the residual austenite as a function of the transformation time in the medium temperature range and the curves representing the kinetics of transformation are similar. For steels for which a decrease in the carbon content of the austenite is characteristic, the sharpest change (decrease) of the lattice period is observed before the α phase begins to separate out, i.e., in the initial stages of transformation. This is obvious from the X-ray exposures taken directly at the transformation temperatures. The austenite transformation in the medium temperature range is characterised by a redistribution of the carbon in the austenite and subsequent martensitic transformation in these

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Redistribution of carbon during transformation of austenite in the medium range. (Cont.) 126-2-24/30

austenite sections which have a reduced carbon concentration. For temperatures corresponding to the medium temperature range the formation of nonuniformities as regards the carbon concentration in the austenite is advantageous from the thermodynamic point of view since it brings about a reduction of the free energy of the system. The direction of the process of redistribution of carbon in the austenite at temperatures of the medium temperature range is determined by kinetic factors. In steels containing 0.3 to 0.6% C, movement of the carbon into the remaining part of the austenite may prove kinetically more advantageous than the formation of cementite, which requires a carbon concentration increase to 6.7% and, consequently, it requires diffusion from distant spots. In steels containing 0.7 to 1% C, in which no changes of the average lattice period of the residual austenite are observed during transformation in the medium temperature range, removal of carbon from the sections with reduced concentration into the remaining part of the austenite and separation of cementite is equally likely. Interaction between the atoms of Fe, C and of the alloying elements can change appreciably the

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Redistribution of carbon during transformation of austenite in the medium range. (Cont.) 126-2-24/30

degree of the redistribution of C in the austenite; for instance, alloying with Si leads to a very considerable carbon enrichment of the residual austenite. Even in high carbon steel which is alloyed with Si, transformation of the austenite in the medium temperature range involves an increase in the carbon content in the residual austenite by 0.5 to 0.6%. Thereby, the specific influence of Si is explained by the inhibition of the processes of carbide formation. The higher the transformation temperature in the medium temperature range, the more will the carbon content be lowered in those austenite sections which are subsequently subjected to martensitic transformation. This conclusion is confirmed by the dependence of the degree of the change of the carbon concentration in the austenite on the transformation temperature (for an equal degree of transformation). Self braking of the reaction in the medium range is not linked with a redistribution of the carbon and is obviously the result of the martensitic mechanism of γ to α transformations. The influence of alloying elements on the kinetics of transformation of the austenite in the medium

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Redistribution of carbon during transformation of austenite in the medium range. (Cont.) 126-2-24/30

range is apparently determined by their effect on the diffusion speed of the carbon and the diffusion paths.

There are 7 figures, 2 tables and 17 references, of which 11 are Slavic.

SUBMITTED: July 24, 1956.

ASSOCIATION: Institute of Metallography and Metal Physics,
TsNIICHM. (Institut Metallovedeniya i Fiziki Metallov
TsNIICHM).

AVAILABLE:

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Entin, R. I.
AUTHORS: Kogan, L. I., and Entin, R. I.

126-2-20/35

TITLE: On secondary hardening of structural steels.
(O vtorichnoy zakalke konstruktсионnykh staley).

PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol.5, No.2,
pp. 349-354 (USSR)

ABSTRACT: The causes are investigated of secondary hardening of structural steels in conjunction with experimental investigation of the changes of the crystal lattice period of residual austenite. In some structural and tool steels tempering at 500 to 600°C brings about a secondary hardening, i.e., transformation of residual austenite into martensite during subsequent cooling. Secondary hardening in structural steels was observed during tempering only if the hardening was effected under conditions ensuring partial transformation of austenite in the medium temperature range. Investigation of the secondary hardening was effected on the two steels 34XFC2 and 73XH3, the compositions of which are as follows: 0.34% C, 2.5% Si, 1.08% Mn, 1.89% Cr and 0.73% C, 0.3% Si, 0.78% Mn, 0.7% Cr, 3.48% Ni respectively. The heat treatment of chromated specimens of 3 x 5 x 25 mm was effected in an "anizometer"; the

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On secondary hardening of structural steels.

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specimens were heated in the furnace to 1000 and 900°C respectively for six minutes and then transferred into a tin bath which was heated to 300-400°C and finally quenched in oil. Following that, one of two specimens was heated in the oil bath of the anisometer to 500-550°C and then cooled to 280°C inside the bath with the heater switched off and finally transferred to an oil bath of the same temperature in which it was cooled to room temperature. Due to such slow cooling below the martensitic point, a maximum quantity of residual austenite remained in the specimen which facilitated measuring the period of the crystal lattice. During the process of cooling, the deflection of the light beam of the anisometer was recorded and from the obtained data the cooling curves were plotted which were compared with the cooling curves obtained for a specimen of the same steel containing 100% of the magnetic phase. A bend in the cooling curve was taken as an indication of the existence of a secondary hardening. After the heat treatment the specimens were etched and investigated by means of the X-ray ionization instrument YPC-50-N at room temperature. The period of the austenite lattice

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